REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1, 2, 5, 6, 8, 9, 11 through 14, 17, 18, and 20 through 26 remain in this case. Claims 3, 10, and 15 are canceled. Claims 1, 9, 13, 21, 22, and 25 are amended.

Claims 1 through 3, 5, 6, 8 through 15, 17, 18, and 20 through 26 were all rejected under §112, ¶1 because the specification fails to comply with the written description requirement.

The Examiner has maintained the rejection and objection to passages of the specification[1] that contain the parameters *n*, *m*, and D, which the Examiner found to be undefined. In response to Applicant's previous arguments, the Examiner now asserts that an "understanding of the chemical entities involved in the claimed invention is vital to understanding the claimed invention".[2]

Applicant again traverses this basis of the rejection. It is well-known in the art to use variable name parameters, such as *n* and *m*,[3] to indicate the number of atoms of a constituent element that are present in a molecule of a compound in cases in which the actual stoichiometry is not known or is unimportant. The skilled reader will also realize, from the context of the use of these parameters in the specification, that the particular values of parameters *n* and *m* are not important to understanding this invention, but will depend on the particular species. Therefore, Applicant submits that the variable name parameters *n* and *m* are not "chemical entities" *per se*, but simply refer to numbers of atoms that may be present in a given compound. Applicant submits that one skilled in the art having reference to this specification would clearly understand the meaning of the parameters *n* and *m*, and respectfully traverses this basis of the rejection.

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[1] Specification of S.N. 10/826,613, page 7, lines 18 through 21; page 9, lines 6 and 7; page 20, lines 6 through 8.
[2] Office Action of July 25, 2006, page 3.
[3] Or, alternatively, *x* and *y*.

Regarding the parameter D, Applicant again maintains that this parameter D clearly refers to a constituent of a compound to which the R^2 species is bound, which enables the R^2 species to then react with and displace the reactive species X. The D constituent does not participate in the reaction, as is evident from the specification, and as such its particular identity is unimportant in the context of the invention as described in that location of the specification. The presence of some constituent D is useful to the reader, however, because it indicates that the compound DR^2 is indeed a compound. And the specification itself clearly states that the nucleophilic molecule has "the general formula DR^2".[4] Therefore, the skilled reader would clearly understand, from the specification, that the parameter D corresponds to a reagent that reacts with the unreactive organic substituent R^2 to form a nucleophilic molecule having the general formula DR^2, examples of which include alcohols, amines, carboxylic acides, pehols, thiols, and phosphoric acids.[5] Accordingly, Applicant submits that one skilled in the art having reference to this specification would clearly understand the meaning of the parameter D, and respectfully traverses this basis of the rejection.

The Examiner also again rejected the claims under §112, ¶1 because it was unclear whether the "O" characters above the surface in the Figures are oxygen atoms, and if so, how the oxygen atoms are attached to the surface. Applicant again traverses this basis of the rejection. It is readily apparent from the description[6] that the original surface being treated is an oxidized surface. The "O" characters thus clearly refer to the oxygen atoms within such oxide compounds (*i.e.,* the "oxidized" substance). And Applicant respectfully submits that the manner in which oxygen atoms are "attached" within molecules of an oxide compound is a fundamental concept, known by those having the slightest training in chemistry. Specifically, Applicant submits that the types of chemical bonds by way of which oxygen may be bound in an oxide compound is well-known, if not fundamental in the art of chemistry.[7] Applicant therefore respectfully submits that the Figures are not unclear in this regard, and traverses the rejection on this basis.

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[4] Specification, *supra,* page 7, line 21.
[5] Specification, *supra,* page 8, lines 7 through 9.
[6] Specification, *supra,* page 7, lines 16 through 20.
[7] *See, e.g.,* http://en.wikipedia.org/wiki/Chemical_bond.

For the foregoing reasons, Applicant submits that the claims in this case are fully supported by a written description, within the requirements of §112, ¶1.

Claim 10 was also rejected under §112, ¶1, as not complying with the written description requirement because the phrase "at a second temperature above the first temperature" is not described in the specification. Claim 10 is canceled by this amendment to advance the prosecution of this case. The canceling of claim 10 is not intended as acquiescence to the rejection of this claim, and should not be interpreted as such.

Claim 22 was rejected under §112, ¶1, as not complying with the written description requirement because its phrase "at a temperature above an environmental temperature to which the coating is expected to be exposed in later processing" is not present in the specification. Claim 22 was also rejected under §112, ¶2 because of a lack of clarity regarding the phrase "in later processing". Claim 22 is amended to overcome the rejection, by striking the objectionable phrase "in later processing", in a manner consistent with the specification.[8] Applicant therefore submits that amended claim 22 is now adequately supported by the written description, and is sufficiently definite to apprise those skilled in the art of the claimed subject matter.

Claims 1, 13, and 25 were all specifically rejected because the phrase "a compound having a reactive group" is new matter, and not present in the specification as filed. Applicant respectfully traverses this basis of the rejection. The specification clearly describes that an active species having a general formula of AX_n or $A(R^1)_mX_n$ is reacted with an oxidized surface to which it covalently bonds, and after which "[r]eactive groups are exposed for further chemistry".[9] This passage of the specification goes on to describe that a nucleophilic molecule then "reacts with and displaces the exposed reactive groups".[10] This express statement of the presence of "reactive groups" *verbatim* in the specification, as in the claims, belies any finding that the phrase "compound having a reactive group" is new matter. Reconsideration of this basis of the rejection is requested.

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[8] Specification, *supra,* page 8, lines 21 through 31.
[9] Specification, *supra,* page 7, lines 19 and 20.
[10] Specification, *supra,* page 7, lines 20 through 24.

Claim 13 was also rejected under §112, ¶1 as not enabled by the specification. The Examiner found that the term "metalloid" is not present in the specification, and that therefore the recitation of "metalloid" in claim 13 is not enabled.

Applicant respectfully traverses, on the grounds that at least one example of a metalloid is present in the specification. In this regard, Applicant submits that silicon is a well-known metalloid.[11] And the specification clearly lists silicon as one of the elements which can serve as constituent A in the active species.[12] Therefore, because at least one example of a "metalloid" is expressly described in the specification, and given the broad context of that description[13], Applicant submits that claim 13 is fully enabled by the specification. Reconsideration of this basis of the rejection is requested.

Claims 1, 13, and 25 were also rejected under §112, ¶2, as indefinite because of the lack of definition regarding the parameters *n* and *m*, which the Examiner found to cause the claims to be vague and indefinite. As previously argued,

Each of claims 1, 13, and 25 are amended to overcome the rejection,[14] by stating that the active species is now comprised of a constituent A and an active group X (claim 1); a constituent A, a constituent R^1, and an active group X (claim 13); and Si and an active group X (claim 25). Applicant submits that no new matter is presented by this amendment to claims 1, 13, and 25, considering that the new statement of the composition of the active species is fully within and supported by claims 1, 13, and 25 as originally filed and as previously presented. Applicant also respectfully submits that this amendment to claims 1, 13, and 25 obviates the rejection under §112, ¶2, by eliminating the objectionable suffixes.

Claims 9 and 21 were rejected under §112, ¶2, as indefinite because the species D and R^2 are not defined and are thus vague and indefinite, and because it is unclear what role DR^2 plays in the claimed methods. Claims 9 and 21 are each amended to overcome the rejection, by

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[11] *See, e.g.,* http://en.wikipedia.org/wiki/Metalloid.
[12] Specification, *supra,* page 7, lines 26 through 30.
[13] *Id.,* (". . . A may be any metal, semimetal, transition metal, or ceramic species including but lint not limited to Si, Zr, Hf, Nb, Ti, Ta, Cu, Ag, and Al . . . ")

substituting the term "nucleophilic molecule" for the formula DR^2 as the entity that is selected from the specified group. This amendment to claims 9 and 21 is clearly supported by the specification,[15] and therefore no new matter is presented by this amendment. Applicant submits that this amendment to claims 9 and 21 obviates the basis of the §112 rejection that is specific to these claims.

Claims 3 and 15 were rejected under §112, ¶2 as indefinite because antecedent basis is lacking for the term "the underlying surface". Claims 3 and 15 are canceled, obviating this specific rejection to those claims.

Claims 1, 6, 13, and 18 were rejected under §112, ¶2 because the term "semimetal" is not defined, and thus vague and indefinite. Applicant traverses this basis of the rejection, on the grounds that the skilled reader would know full well what a "semimetal" is. Applicant submits that a "semimetal" is known in the art as a material that has a small overlap in the energy of the conduction and valence bands, examples of which include tin and graphite.[16] Accordingly, Applicant submits that the term "semimetal" as used in claims 1, 6, 13, and 18 is well-defined in the art, and that therefore its use in these claims is neither vague nor indefinite. Reconsideration of this basis of the rejection is respectfully requested.

Claim 13 was also rejected under §112, ¶2 as indefinite because of the use of the term "metalloid". Applicant respectfully traverses the rejection, on the grounds that the term metalloid is well understood in the art as those materials, such as silicon, that have chemical properties intermediate between those of metals and nonmetals.[17] The term "metalloid" thus has a definition that is well-known in the art, and as such Applicant submits that this term is neither vague nor indefinite. Reconsideration of this basis of the rejection is requested.

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[14] Without acquiescence thereto.
[15] Specification, *supra,* page 7, lines 20 through 22; page 8, lines 7 through 9.
[16] *See, e.g.,* http://en.wikipedia.org/wiki/Semimetal.
[17] *See, e.g.,* http://en.wikipedia.org/wiki/Metalloid.

Claims 1 through 3, 5, 6, 8 through 15, 17, 18, and 20 through 26 were yet again rejected under §102 as anticipated by the Ogawa et al. reference.[18] The Examiner again asserted that the reference teaches the applying of TEOS or other alkoxysilanes to substrates such as glass, metal and ceramics,[19] and that the trimethyoxy groups hydrolyze to an alcohol, and react with the TEOS on the substrate to form a water repellent fluorine-containing coating.[20] In response to the previous arguments of Applicant, the Examiner asserts that the Figures and paragraph [0146] of the reference show that the disclosed reaction of the silane compound with the TEOS coating forms a new film, rather than two independent films.[21]

Applicant respectfully submits that amended claims 1, 13, and 25 are novel and patentably distinct over the Ogawa et al. reference, because the reference does not meet the requirements of the claims.

As previously argued, Applicant submits that the Ogawa et al. reference nowhere discloses the reacting of a nucleophilic molecule with a reactive group at an exposed surface following the first reacting step, to form a bond between the nucleophilic molecule and constituent A of the active species. Referring to the location of the reference cited by the Examiner as teaching the second reacting step,[22] it is apparent that there is no reacting of the fluoroalkyl trimethoxy silane compound with a reactive group then at the surface, so that a nucleophilic molecule in this compound forms a bond with a constituent A at the surface. A full reading of paragraphs [0145] and [0146], within the context of the reference, clearly indicates that the fluoroalkyl trimethoxy silane compound is applied in a methanol solvent, and after evaporation of that solvent, forms a "coating film made of a fluoroalkyl trimethoxy silane compound".[23] In other words, the Ogawa et al. reference teaches that a second film is formed over a first film.[24] Indeed, claim 30 of the Ogawa et al. reference clearly refers to the two-film

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[18] U.S. Patent Publication No. 2001/0031364, published October 18, 2001, on an application by Ogawa et al. filed March 29, 2001.
[19] Ogawa et al, *supra,* paragraphs [0082] and [0084].
[20] *Id.,* paragraphs [0136] and [0153].
[21] Office Action, *supra,* page 8.
[22] *Id.,* paragraph [0145].
[23] *Id.,* paragraph [0146].
[24] *See also* Ogawa et al., *supra,* paragraph [0079].

structure of: 1) a fluorine-containing coating film, and 2) a silica-based coating film interposed between the substrate and the fluorine-containing coating film.[25]

Applicant further respectfully submits that the characterization of the Ogawa et al. reference presented by the Examiner, in response to Applicant's previous arguments, is belied by the reference itself. The Examiner again asserts that paragraph [0146] and Figure 5 indicate that Ogawa et al. teach forming one film, rather than two independent films. To the extent that Figure 5 relates to paragraph [0146],[26] Figure 5 clearly shows two films: silica-based coating film 12, and fluorine-containing coating film 13.[27] It is not clear to the undersigned how the molecular-level diagram of Figure 5 would more clearly show two films that are bonded together that it does in its current form. In addition, paragraph [0146] of Ogawa et al. also clearly refers to two films: the "first layer of silica-based coating film", and "a coating film of a fluoroalkyl trimethoxy silane compound".[28] It is especially instructive, in this regard, that the reference describes this process as applying a fluoroalkyl trimethoxy silane compound to the substrate "provided with the first layer of silica-based coating film", with the result (after dealcoholization) being "a coating film of a fluoroalkyl trimethoxy silane compound".[29] These two films are clearly two films. The Examiner's point regarding Ogawa et al. and Applicant's previous arguments thus remains misplaced.

Therefore, because each of the claims in this case require the forming of a coating by reacting a nucleophilic molecule, having an organic substituent not reactive with active group X, with a reactive group in a previously formed compound to form a bond between the nucleophilic molecule and A or Si, Applicant respectfully submits that the Ogawa et al. reference falls short of the requirements of independent claims 1, 13, and 25. Applicant therefore submits that all of the claims in this case are therefore novel over the Ogawa et al. reference.

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[25] *Id.*, claim 30.
[26] Which it may not, relating instead to paragraph [0149] *et seq.*
[27] Ogawa et al., *supra,* paragraph [0150].
[28] Ogawa et al., *supra,* paragraph [0146].
[29] *Id.*

The Examiner also yet again rejected each of the remaining claims in this case under §102 as anticipated by the Europe '740 reference.[30] The Examiner asserted that the reference teaches the applying of TEOS or other alkoxysilanes to substrates, followed by the application of a fluoroalkyl trimethoxysilane.[31] The Examiner further asserted that the trimethyoxy groups hydrolyze to an alcohol, and that the heating of the coating also meets the limitations of claims 10 and 22. And in response to Applicant's previous argument that Figure 1b of the reference does not show bonds, the Examiner asserted that Figure 1c of the reference "shows these bonds".[32]

Applicant again respectfully submits that the claims in this case are novel over Europe '740. As in the case of the Ogawa et al. reference, the Examiner does not assert that the reference teaches, and the reference in fact does not teach, the reacting of a nucleophilic molecule, having an organic substituent, with a reactive group to form a bond between the nucleophilic molecule and a constituent A (claims 1 and 13) or Si (claims 25 and 26). As in the case of the Ogawa et al. reference, this reference also discloses the applying of a second coating over a first film, with no disclosed reacting between the alleged nucleophilic molecule and a constituent A (*e.g.,* Si) from the first reacting. The absence of this reacting is especially evident from Figure 1 of Europe '740, in which the second coating step (b) adds an additional layer including silicon atoms, with no illustrated bond between any alleged nucleophilic molecule and an underlying silicon atom, for example, from the first coating step (a). And Figure 1 also shows that process step (c) merely "polymerizes" the component of the underlying layer[33] – no reacting as required by the claims is taught by this Figure 1c). Accordingly, Applicant again submits that the teachings of Europe '740 fall short of the requirements of each of the claims in this case.

For these reasons, Applicant respectfully submits that Europe '740 falls short of the requirements of these claims. Applicant therefore submits that all of the claims in this case are therefore novel over that reference also.

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[30] European Patent Publication EP 1 153 740 A1, published November 14, 2001.
[31] '740, *supra,* paragraphs [0089], [0104], [0130].
[32] Office Action, *supra,* page 9.
[33] Europe '740, *supra,* paragraph [0115].

Applicant further submits that the claims in this case are not only novel, but are patentably distinct over the prior art in this case. In particular, as clearly described in the specification,[34] this invention provides the important advantages of a single monolayer that is very regular, and hydrophobic, such that water is prevented from adhering to the small surface. Intermolecular forces from this water, and also the effects of van der Waals, dipole, or capillary forces, are thus prevented from effecting very small moving elements, such as the micromachined device as a digital micromirror. These important benefits stem directly from the difference between the claims and the prior art in this case, and strongly illustrate the patentability of these claims.

For these reasons, Applicant respectfully submits that all claims in this case are in condition for allowance. Reconsideration of this application is respectfully requested.

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[34] Specification, *supra,* page 11, lines 2 through 10; page 12, line 25 through page 13, line 2.